

Washington State Report to National Tsunami Hazard Mitigation Program

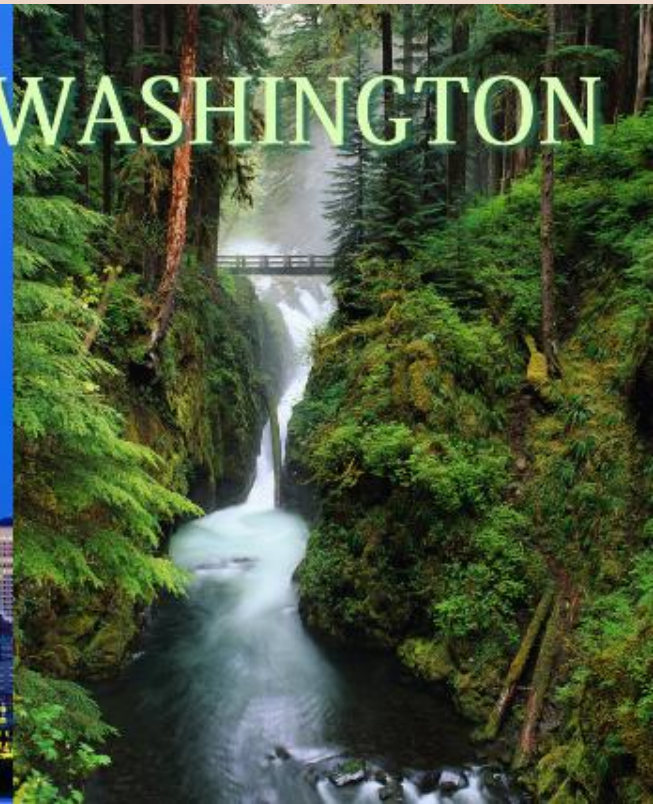


Presented By:

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Washington State Emergency Management Division



Washington Military Department
Emergency Management Division

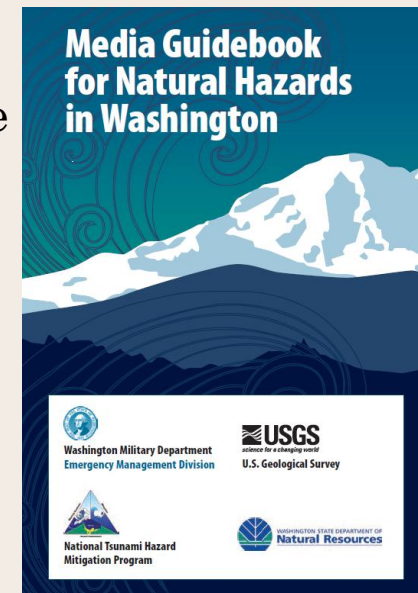
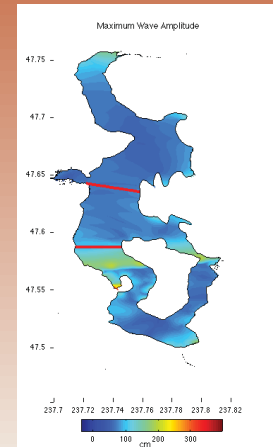
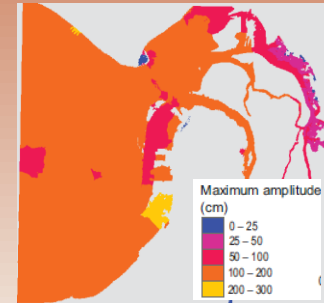


2009-10 Accomplishments

Washington State Emergency Management & Department of Natural Resources

(\$1.97M Funding Received for 2009-10)

- Inundation modeling completed by PMEL for the City of Everett and for a Seattle Fault generated tsunami in Lake Washington.
- The Washington State-Local Tsunami Workgroup met quarterly to coordinate education & outreach efforts as well as exercise response procedures through the Pacifex series.
- In partnership with WA DNR and local jurisdictions, WA EMD continued to provide training on the Disaster Response Guidebook for Hotels and Motels on the Washington Coast.
 - Thirty-seven (37) lodging establishments in Jefferson & Clallam Counties participated in the training during 2009-2010.
- The “*Media Guide to Natural Hazards in Washington*” was completed and distributed throughout all of Seattle and to 100% of coastal broadcasters. This edition replaces the Tsunami Broadcaster’s Guidebook and now incorporates a volcano section.



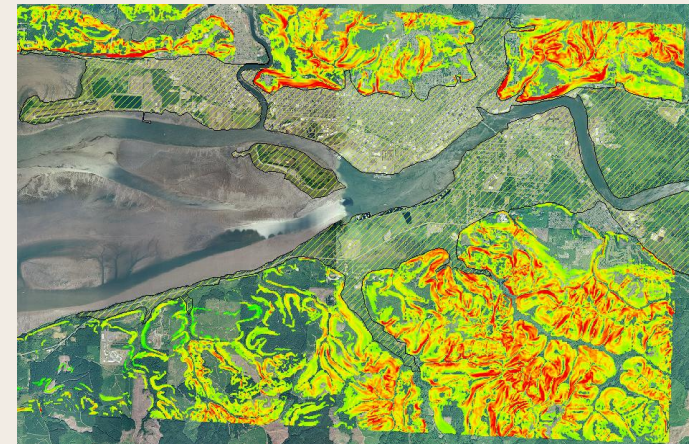
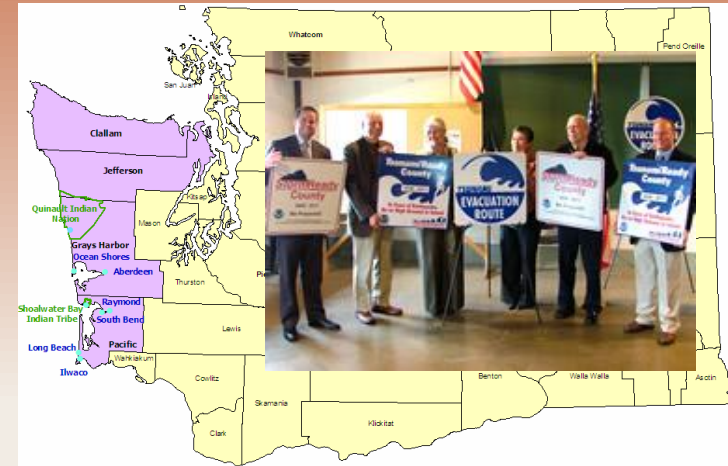
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2009-10 Accomplishments

Washington State Emergency Management & Department of Natural Resources

(\$1.97M Funding Received for 2009-10)

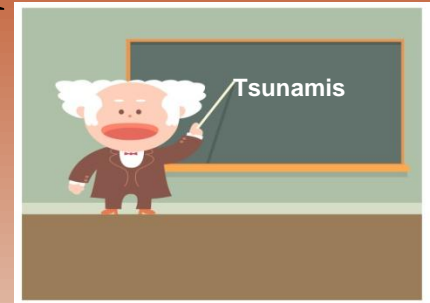
- The Shoalwater Bay Indian Tribe, the City of South Bend and the City of Raymond were recognized as TsunamiReady Communities.
 - In 2008, Washington was the first state in the lower 48 to have all of its outer coastal counties recognized as TsunamiReady.
 - In 2009-10, Pacific County became the first in the lower 48 to have all of it's communities and Indian Tribes recognized as TsunamiReady.
- Continuing to work with WA Department of Natural Resources to publish bi-monthly issues of *TsuInfo Alert*
 - *NTHMP MES evaluation completed in 2010.*
- Washington DNR completed the landslide and liquefaction susceptibility mapping of tsunami evacuation routes for the City of Aberdeen.



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Train-the-Trainer (T-3) Tsunami Public Education Instructor Program

The purpose of the T3 Program is to train a cadre of professionals that are qualified to serve as Tsunami Public Education Instructors at the community level.



- To achieve this, the T3 Program provides participants with a basic understanding of fundamental principles and concepts in:
 - Tsunami Science
 - Tsunami Warning
 - Tsunami Risk Reduction
 - Conducting community-level Tsunami Public Education

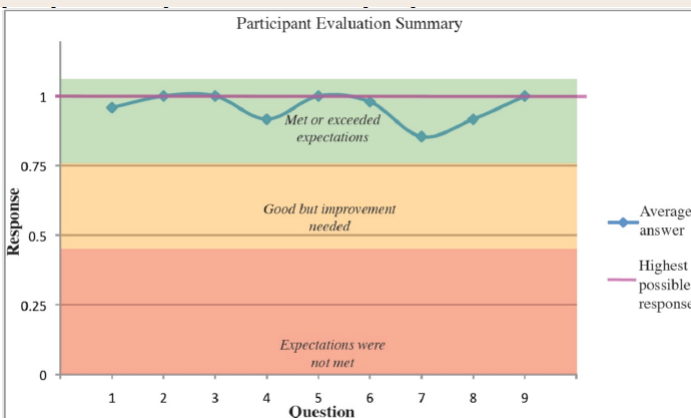


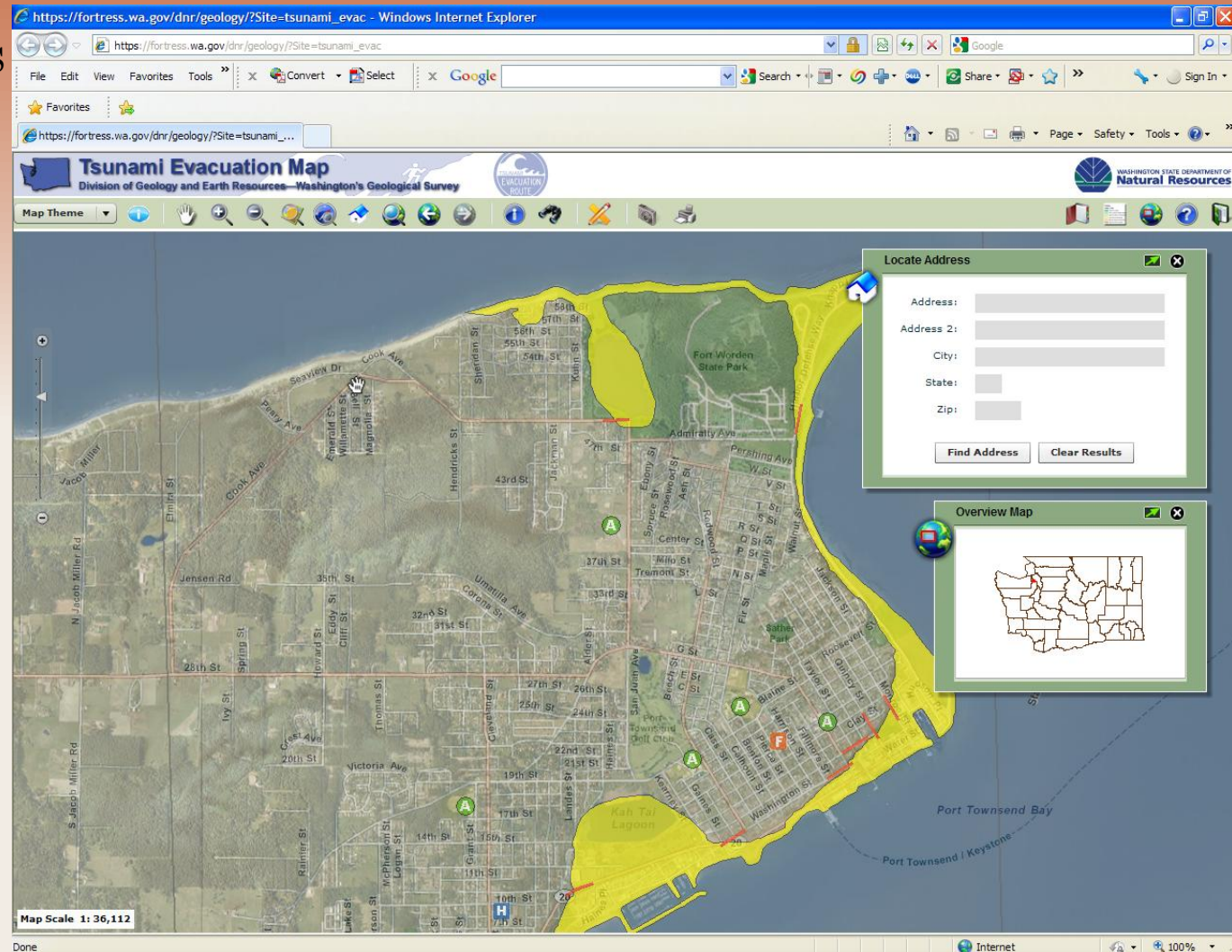
Figure 1: Participant evaluation summary

WA EMD & PMEL conducted a two T-3 courses in which 24 instructors from CERT programs, school districts, cities, counties and tribes participated. To date, T-3 graduates have conducted at least 25 community workshops for 500+ participants.

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NEW Online Tsunami Evacuation Mapping Tool

- Created by WA DNR to replace outdated ArcIMS server product.
- MUCH more user friendly and easy to navigate!!!
- Includes address locator, assembly areas, and inundation zones.
 - Next phase may include pictures of assembly areas
 - Trying to figure out how to turn into a smartphone app.
- Uses ESRI base maps, to eliminate ongoing cost to update imagery, roads, etc.



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Project Safe Haven: Tsunami Vertical Evacuation Long Beach Peninsula/Pacific County



**National Tsunami Hazard
Mitigation Program**



**Washington Military Department
Emergency Management Division**



NOAA



ARCH | CM | LA | UDP

Project Safe Haven: Tsunami Vertical Evacuation

- **Community-based, 'bottom-up' approach!**

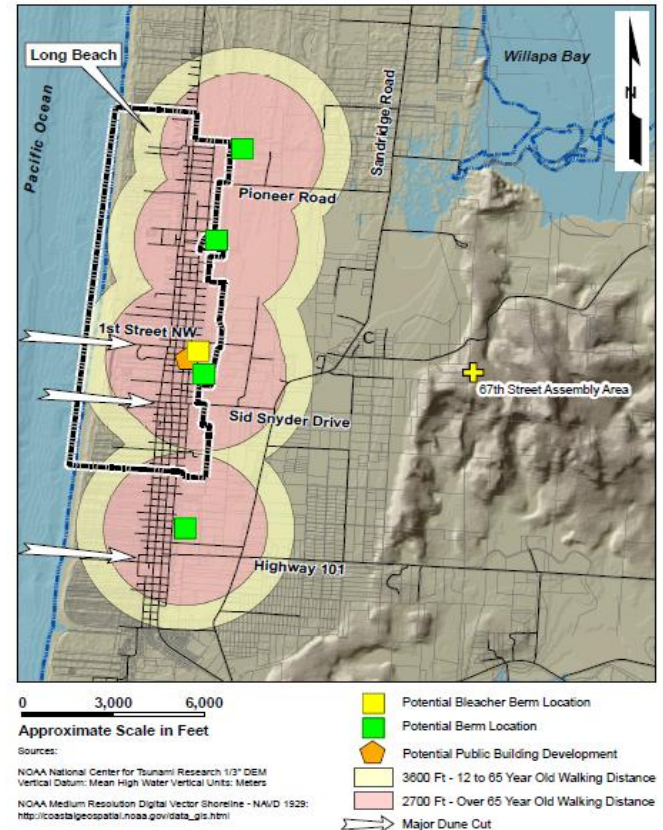
- Phase I- Siting of evacuation safe haven & recommendation on type of solution using the World Café approach.
- Phase II – Urban design by architects and preliminary cost development by project engineers.
- Phase III- Final community report delivered

- All options (buildings, towers, berms, etc.) were on the table for consideration – *After all, this is the community's plan*

Common Themes:

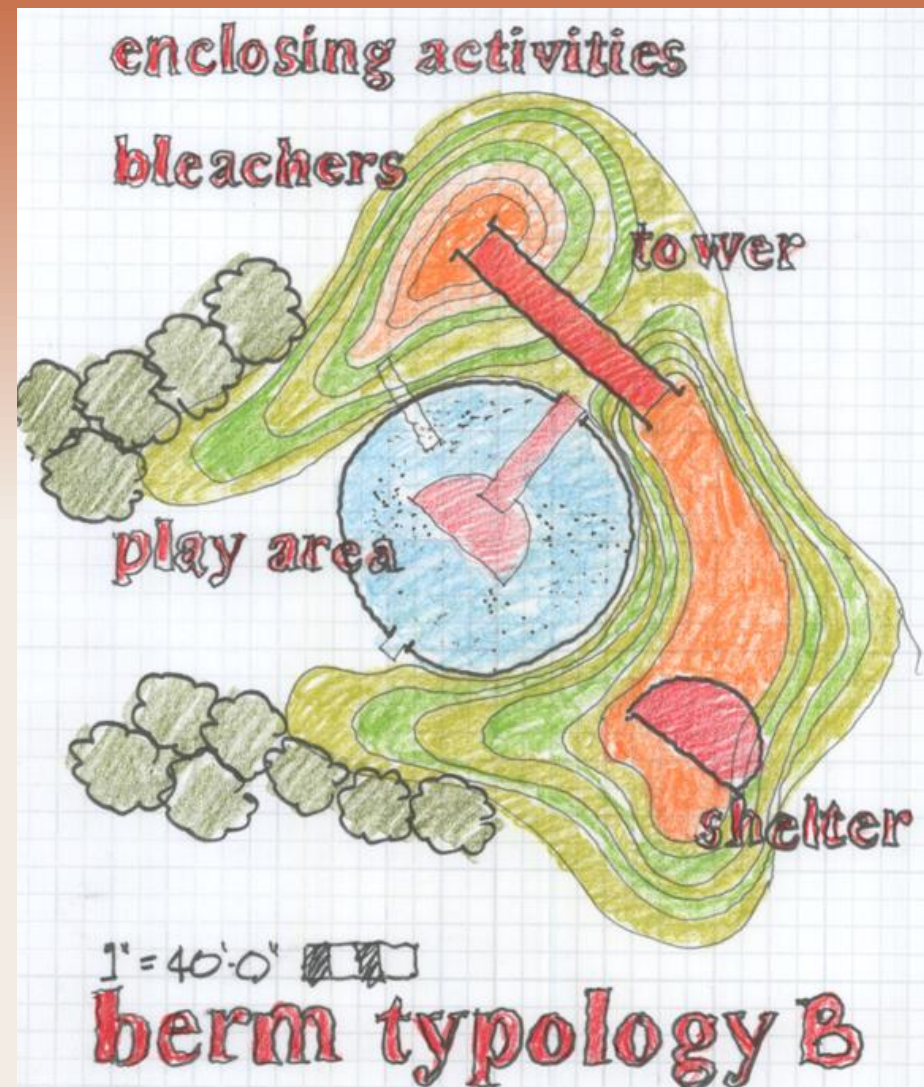
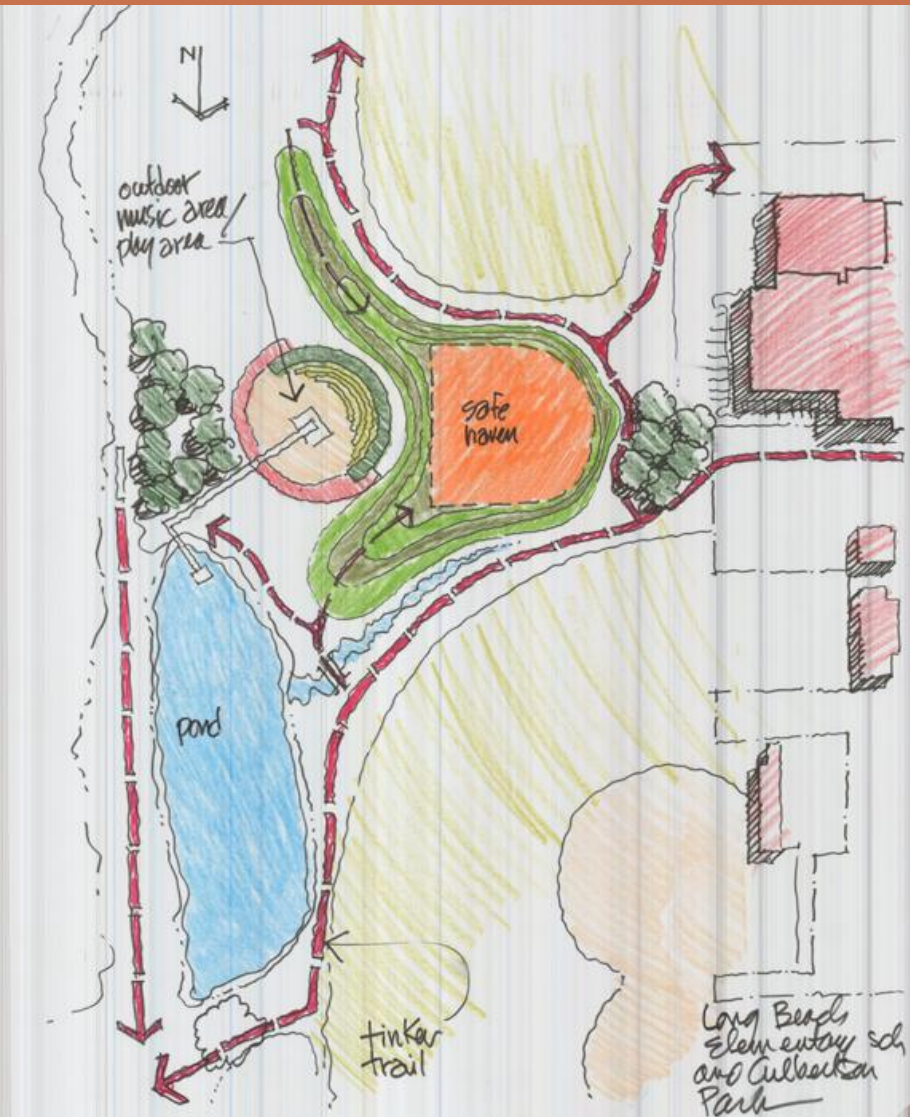
- School safety
- Seniors and special needs populations
- More conservative travel times
- More conservative estimates of elevations

Figure 2 - Preferred Strategy



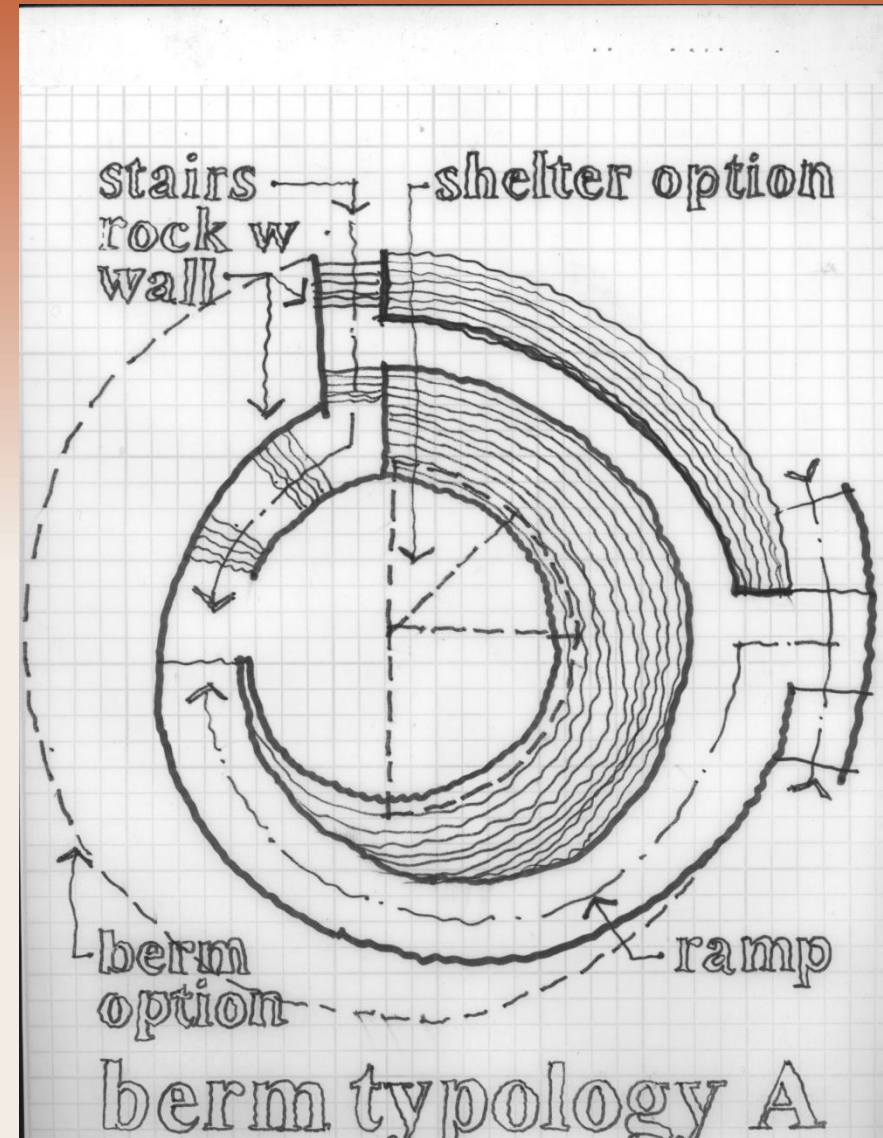
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Safe Haven Berms



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Safe Haven Berms



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Safe Haven Berms



Long Beach Lagoon Park system

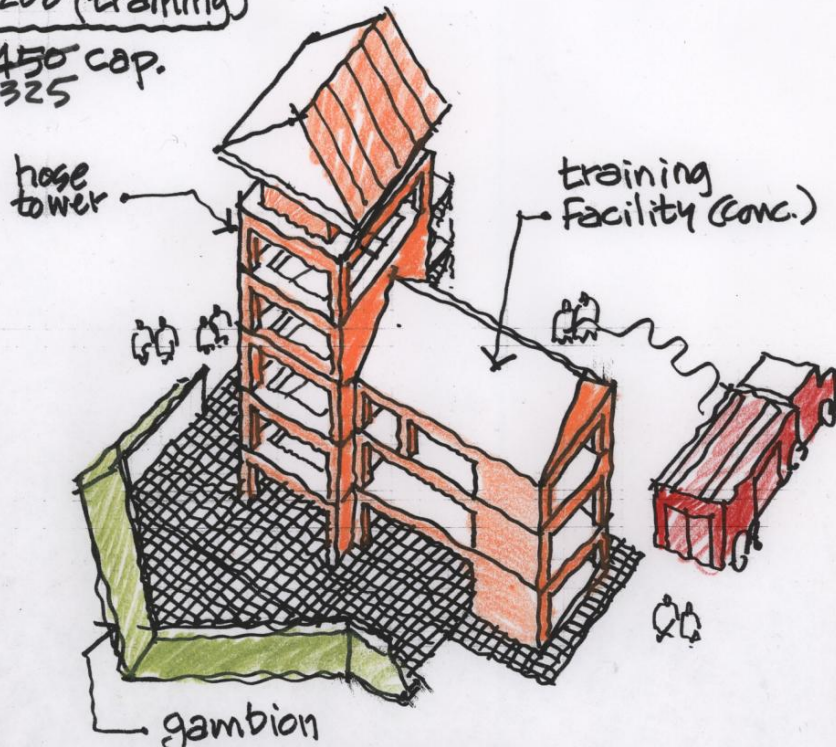
Berm/ramp viewing towers
w/S.H. bridge
100 - 200 people

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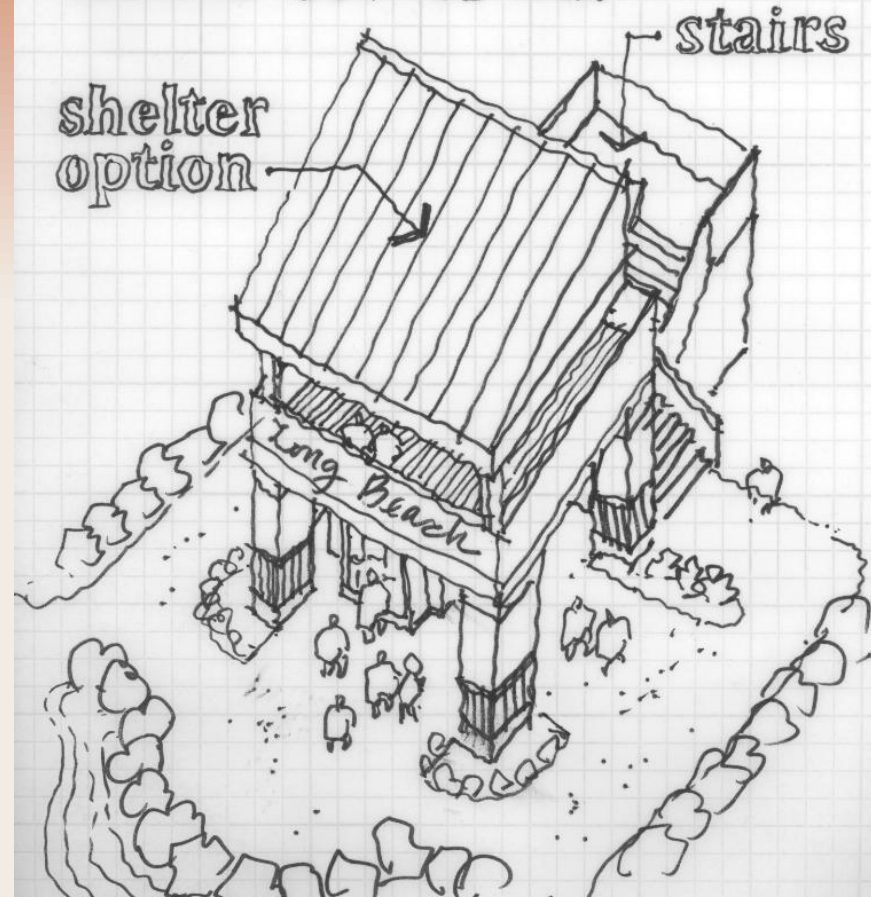
Safe Haven Towers

SAFE HAVEN FIRE HOSE/TOWER/ TRAINING FACILITY

250 (tower)
200 (training)
450 cap.
325

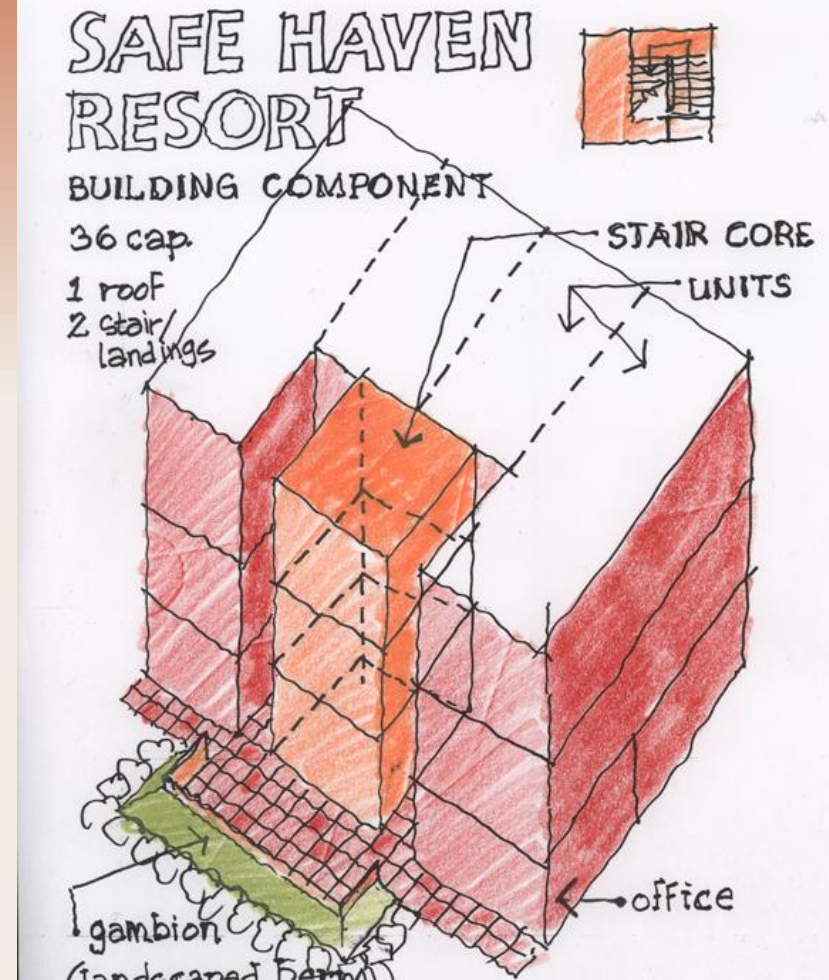
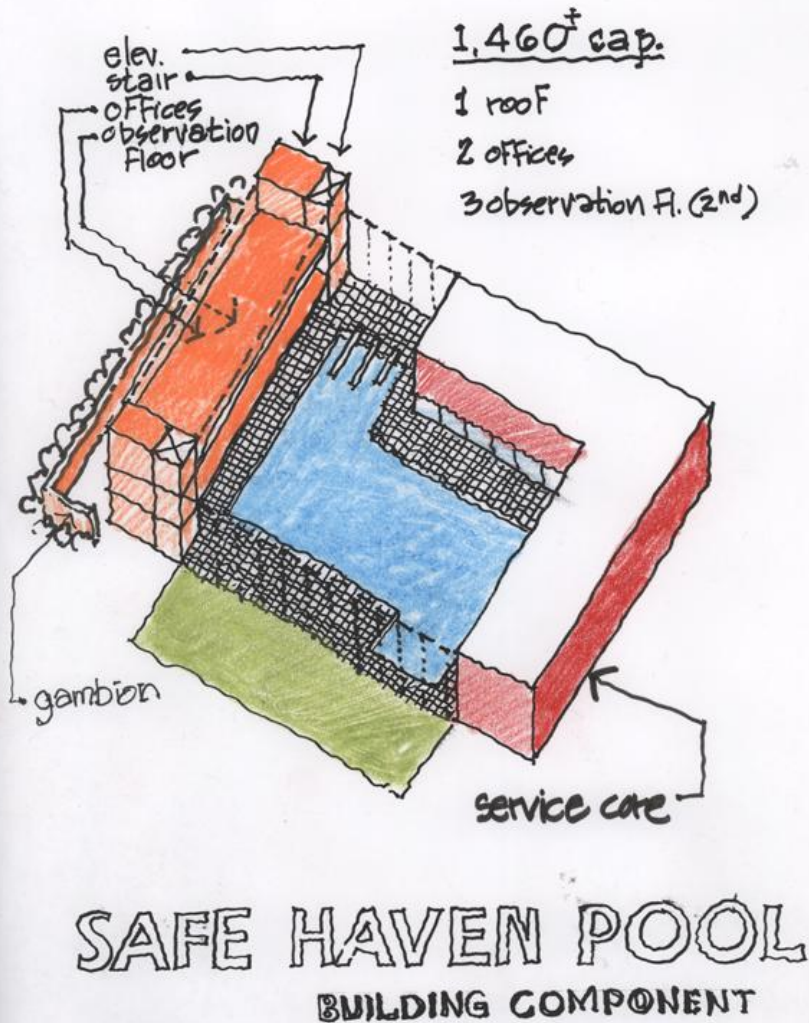


tower typology A visitor center ex.



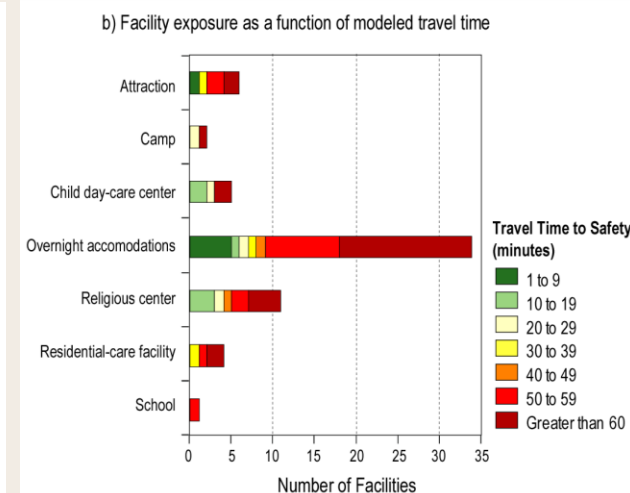
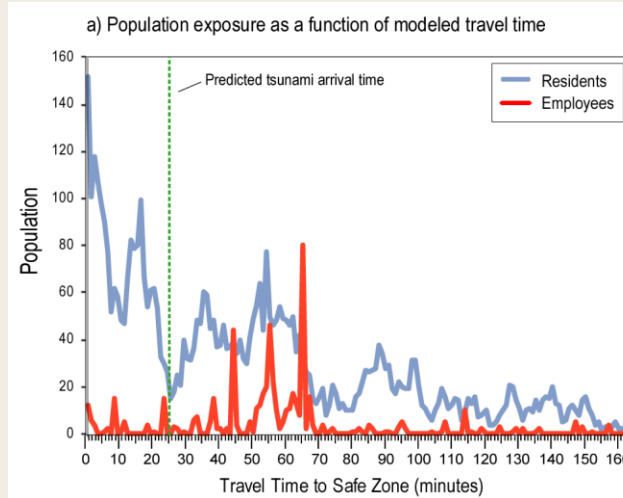
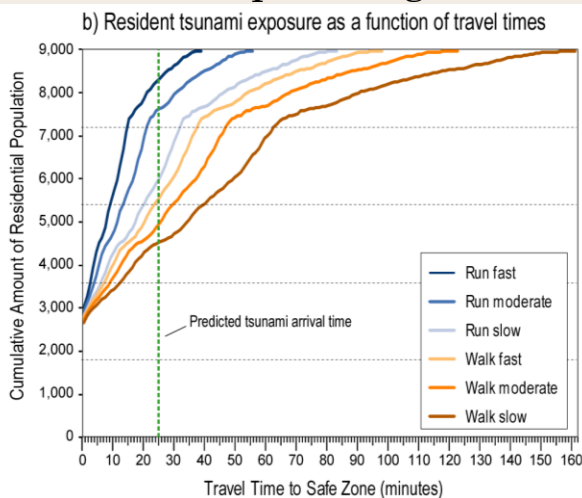
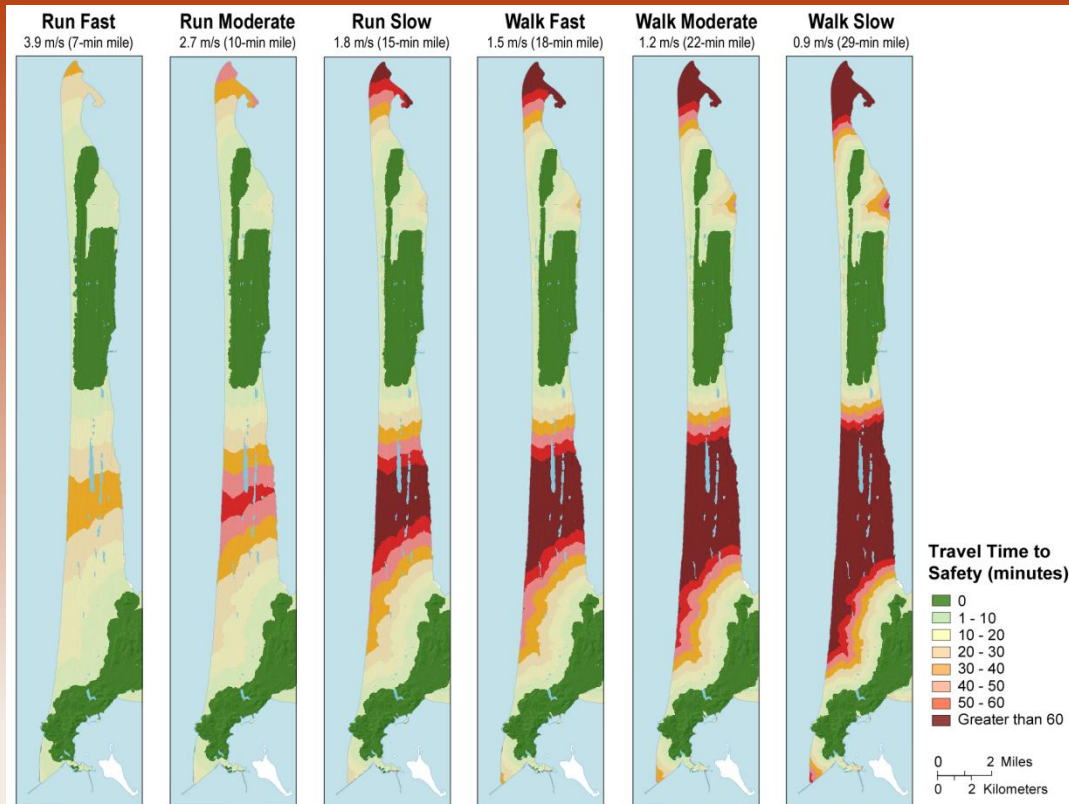
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Safe Haven Buildings



Pedestrian evacuation modeling

- Collaboration between WA EMD, WA DNR, & USGS
- 2011 – Method development
 - Long Beach Peninsula case study
- 2012 (potential)
 - Evacuation-time mapping for entire Washington coast
 - Decision support tool for safe haven planning



2009-10 Accomplishments

Washington State Emergency Management Division & Department of Natural Resources

(\$1.97M Funding Received for 2009-10)

- PMEL has begun modeling of San Juan Islands.
- WA EMD has contracted with the Univ. of Washington Hazard Mitigation Institute to begin Safe Haven vertical evacuation study for Grays Harbor County, WA.
- An updated T-3 course is in the final development stages by WA EMD contractors and a web-based resource page is being created. This version of the curriculum incorporates “lessons learned” from the pilot in early 2009 and two 2010 courses.
- Clallam County Emergency Mgt. and WA EMD implemented a pilot program to distribute 303 NOAA Weather Radios to low-income families on the Olympic Peninsula in January and April 2010.
- The NW Tribal Emergency Management Council and WA EMD have completed planning for deployment of disaster supply caches to coastal tribes. Further investigating procurement options to achieve maximum savings.
- WA EMD finalized contract with David Johnston with GNS for social science research projects over the next one-year period.

Tsunami Warning Communications Test

Pre-Event Awareness Campaign

- Primary groups targeted for Education/Awareness:
 - Schools
 - Residents
 - Lodging Establishments
 - Media Outlets
 - PSA developed by EMD & NOAA
 - Press Releases issued by WA EMD & Locals



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Flyers
distributed
to every
school,
hotel, and
most local
businesses

Chill - It's Only a Drill !

Tsunami Siren Test

September 15, 2010

10:15 a.m.

- If the ground shakes...
- If you hear a siren...
- If the ocean recedes from the shoreline...

Immediately - head to higher ground!







For more information:

Contact Your Local Emergency Management Office

www.emd.wa.gov/mynlmyl_contact_info.shtml

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	Warning •Danger! •Run to higher ground. •Follow emergency instructions.	<p>2219+02676</p> <p>Do you know what to do? Save me - as a reminder!</p> <p>Need more info: www.emd.wa.gov/hazards/haz_tsunami.shtml</p> <hr/> <p>State of Washington MILITARY DEPARTMENT EMERGENCY MANAGEMENT DIVISION MS: TA-20 Building 20 Camp Murray, WA 98430-5122</p> <p>ECRWSS Postal Patron</p>	PRSRT STD US POSTAGE PAID WA STATE DEPT OF PRINTING 98501
	Advisory •Possible strong and dangerous currents. •Be alert, listen to your radio.		
	Watch •Potential danger. •Be prepared to take action.		
	Information Statement •For information only, no tsunami generated.		

Postcards mailed to every household in inundation zone

<p>Chill - It's Only a Drill Earthquake Drill & Tsunami Siren Test September 15, 2010 - 10:15 a.m.</p> 	
<p>Part 1 Earthquake Drill</p> <p><u>ACTIONS:</u></p> <div> <p>DROP</p>  <p>Drop to the ground. Do not run.</p> </div> <div> <p>COVER</p>  <p>Take cover under a desk in a hall, cover your neck with your arm.</p> </div> <div> <p>HOLD</p>  <p>Hold on to the desk leg to keep the desk safely over you.</p> </div>	<p>Part 2 Tsunami Siren Test</p> <p><u>ACTIONS:</u></p> <ul style="list-style-type: none"> ▪ If the ground shakes... ▪ If you hear a siren... ▪ If the ocean recedes from the shoreline... <p>Immediately— head to higher ground!</p> <div>  <p>After an earthquake, a tsunami may follow.</p> <p>Move quickly to higher ground.</p> </div>

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Results...

- Test declared an overwhelming success by media!
- No significant issues were reported!
- NO calls to local 9-1-1 were placed regarding alarmed residents or visitors!
- Amazing! Considering the fact that we broadcast the actual tsunami warning tone across four (4) counties that have:
 - more than 42,972 residents,
 - 24,934 employees
 - 7,029 daily visitors to State Parks



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All-Hazard Alert Broadcast (AHAB) Tsunami Warning System

- Hired an independent third-party conduct a performance evaluation of the AHAB system.
 - Overall, results indicated positive results from system implementation as well as a few areas in which reliability could be improved.
- Washington State and Local Emergency Management Agencies continued to implement a consistent monthly audible testing regimen of the AHAB system using the Westminster Chime tone.
 - Activated by Counties/Tribes on even numbered months
 - Activated by State Emergency Operations Center on odd numbered months.
- Continued Installation of All-Hazard Alert Broadcasting (AHAB) Sirens in coastal communities (6 to be installed in 2011).



Washington State All-Hazard Alert Broadcasting (AHAB) Network

OPERATIONAL (58)

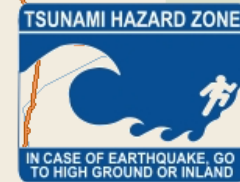
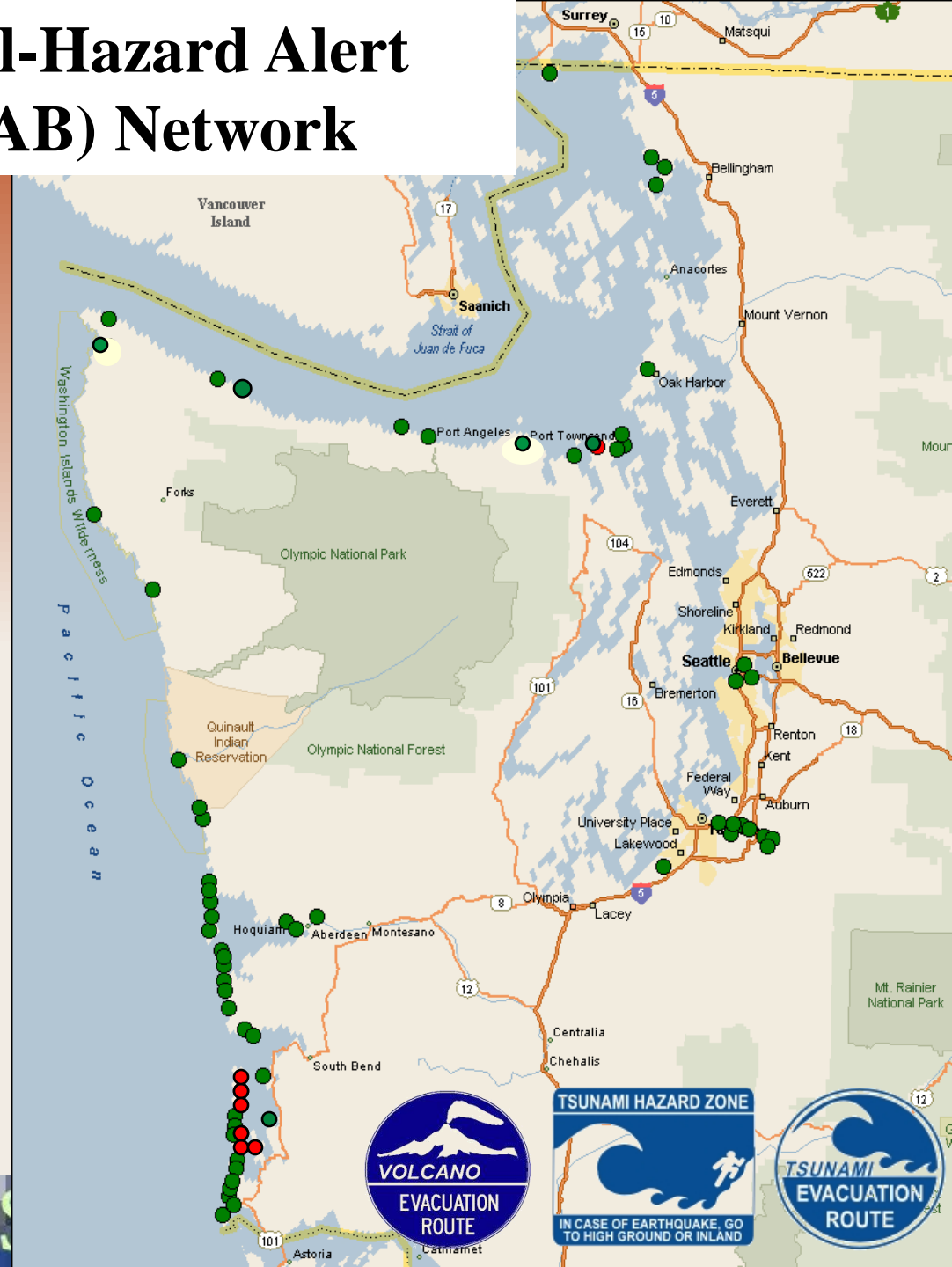
- Aberdeen (2)
- Bay Center
- Cape Disappointment
- Copalis Beach
- Diamond Point
- Fort Worden
- Grayland (3)
- Hoh Tribe
- Hoquiam
- Ilwaco
- Island County
- La Push (Quileute Tribe)
- Long Beach
- Lower Elwha
- Lummi Nation (2)
- McAlder
- McMillin
- Moclips
- Neah Bay
- North Cove
- Ocean City
- Ocean Park (4)
- Ocean Shores (4)
- Orting (3)
- Puyallup (2)
- Pacific Beach
- Pacific Park
- Point Roberts
- Port Angeles
- Port Townsend (2)
- Sandy Point
- Seattle (3)
- Seaview
- Sumner
- Surfside
- Taholah (Quinault Nation)
- Shoalwater Bay Tribe (2)
- Westport (3)
- Camp Murray (Controller)

In Progress (6)

- Long Beach Peninsula

**96 AHABs are needed along the
outer coast for tsunami warning**

Current: 50 tsunami, 8 lahar



Issues Encountered by Washington State Emergency Management Division

- Contracting/Procurement
 - New/additional requirements due to budget crisis have dramatically increased processing times.
- Perception vs. Reality
- TsunamiReady Roundtables
 - One on one works better!
- Tsunami Inundation/Evacuation Maps
 - Mapping non-modeled areas
 - Mapping of areas with numerous levees
- AHAB Program Review
 - Didn't want to buy additional sirens until report was completed.
 - No longer an issue.
- Social Science Survey's
 - Implementing suggested changes within communities (buy-in)
- TsunamiReady
 - Getting communities to apply
 - Refuting issues identified in the NAS report that program is ineffective

Washington State Emergency Management FY 11 Funding Request

Task (Activity) Name	NTHMP Performance Metric(s) (from Strategic Plan) Supported	Amount of Requested Funds
Task 1.1: Contract with NOAA/PMEL to complete modeling for a landslide generated tsunami in Lake Washington.	<ul style="list-style-type: none">▪ Determine the potential inundation zones for non-mapped coastal regions using the established guidelines by 2012.	\$80,000.00
Task 1.2: Host a series of focus groups to evaluate tsunami models developed under Task 1.1 and potential impact to current evacuation sites and evacuation policy.	<ul style="list-style-type: none">▪ Determine the potential inundation zones for non-mapped coastal regions using the established guidelines by 2012.▪ Tsunami inundation maps that support informed decision making in tsunami-threatened communities	\$2,292.00
Task 2.1: Conduct town hall meetings in tsunami prone communities with Emergency Managers, local officials, and land use planners.	<ul style="list-style-type: none">▪ Develop decision support tools for emergency responders to better visualize and plan for potential impacts.▪ Promote integration of tsunami inundation research into building codes and land use planning.	\$2,292.00

Washington State Emergency Management

FY 11 Funding Request

Task (Activity) Name	NTHMP Performance Metric(s) (from Strategic Plan) Supported	Amount of Requested Funds
Task 2.2: Print and distribute double-sided fact-sheets developed by USGS for coastal communities as update to 2008 report on Community Exposure and Sensitivity.	<ul style="list-style-type: none"> Promote integration of tsunami inundation research into building codes and land use planning. 	\$8,595.00
Task 2.3: Conduct annual multi-county test of the Emergency Alert System (EAS) and All Hazard Alert Broadcast (AHAB) radios in multiple counties.	<ul style="list-style-type: none"> Conduct an annual end-to-end communications test of the U.S. Tsunami Warning System 	\$1,146.00
Task 2.4: Hold four State/ Local Tsunami Work Group meetings to discuss budgets, status of on-going projects and other related efforts by NTHMP and local officials.	<ul style="list-style-type: none"> Develop decision support tools for emergency responders to better visualize and plan for potential impacts. Develop guidelines for mitigation, preparedness, and education programs. 	\$5,730.00

Washington State Emergency Management

FY 11 Funding Request

Task (Activity) Name	NTHMP Performance Metric(s) (from Strategic Plan) Supported	Amount of Requested Funds
Task 2.5: Conduct coastal workshops on the new tsunami resistant design guidance (ATC 64 and FEMA P646) as tool for tsunami vertical evacuation.	<ul style="list-style-type: none"> ▪ Develop decision support tools for emergency responders to better visualize and plan for potential impacts. ▪ Promote the integration of tsunami inundation research into building codes and land use planning. 	\$1,146.00
Task 2.6: Continue to promote Map your Neighborhood in coastal communities by providing annual reproduction of Workbooks, DVDs, CDs, etc.	<ul style="list-style-type: none"> ▪ Promote development of tsunami emergency response procedures including collaboration among federal, state, and local agencies. ▪ Support tsunami outreach efforts to coastal residents, media, coastal businesses, and tourism 	\$11,460.00
Task 2.7: Continue to complete social science surveys in tsunami communities that identify awareness and preparedness levels.	<ul style="list-style-type: none"> ▪ Conduct evaluations to determine the effectiveness of tsunami education products and programs in 10 selected communities by 2010. Repeat every 5 years with goal of improving the percentage of informed citizens by 50%. 	\$11,460.00

Washington State Emergency Management

FY 11 Funding Request

Task (Activity) Name	NTHMP Performance Metric(s) (from Strategic Plan) Supported	Amount of Requested Funds
Task 2.8: Contact coastal hotels/motels in the tsunami inundation zone within Grays Harbor County and provide training/materials to staff.	<ul style="list-style-type: none"> ▪ Develop and distribute tsunami education products for the tourist community (e.g., hotels, cruises, and vacation rental homes) by 2011. 	\$5,730.00
Task 2.9: Support the development of agreements with private landowners and the State that allows citizens to evacuate on to private land during a tsunami and development of auto-unlocking gates.	<ul style="list-style-type: none"> ▪ Ensure communities are prepared to respond during a tsunami event. ▪ Reduction of Loss of life and property damage from tsunamis. 	\$14,325.00
Task 2.10: Conduct and publish a study to indentify potential locations of vertical refuges along the Long Beach Peninsula.	<ul style="list-style-type: none"> ▪ Ensure communities are prepared to respond during a tsunami event. ▪ Reduction of Loss of life and property damage from tsunamis. 	\$80,873.00

Washington State Emergency Management

FY 11 Funding Request

Task (Activity) Name	NTHMP Performance Metric(s) (from Strategic Plan) Supported	Amount of Requested Funds
Task 2.11 Local tribes to locate/install caches of supplies that will be situated at an assembly area for use during evacuation.	<ul style="list-style-type: none"> ▪ Ensure communities are prepared to respond during a tsunami event. ▪ Reduction of Loss of life and property damage from tsunamis. 	\$22,920.00
Task 2.12: Continuation of funding the Tsunami Program Assistant position within the Tsunami Program to ensure that proposed work plan tasks are achieved within the proposed timelines.	<ul style="list-style-type: none"> ▪ Reduction of Loss of life and property damage from tsunamis. ▪ Establishment of more Tsunami resilient communities. ▪ Ensure communities are prepared to respond during a tsunami event. 	\$86,189.03 (incl. salary and benefits)
Task 2.13: Partner with WA DNR to provide tsunami inundation and evacuation maps in an online GIS based format.	<ul style="list-style-type: none"> ▪ Ensure communities are prepared to respond during a tsunami event. ▪ Tsunami inundation maps that support informed decision making in tsunami-threatened communities. 	\$0.00

Washington State Emergency Management FY 11 Funding Request

Task (Activity) Name	NTHMP Performance Metric(s) (from Strategic Plan) Supported	Amount of Requested Funds
Task 2.14: Partner with NWS Seattle/Portland to update media tool kit and provide training to broadcasters that support tsunami warning procedures.	<ul style="list-style-type: none">▪ Support tsunami outreach efforts to coastal residents, media, coastal businesses, and tourism	\$5,730.00
Task 3.1: Continue to install the All Hazard Alert Broadcasting(AHAB) Radios in areas of population along the coast and evaluate used CSEPP sirens for possible installation along the coast.	<ul style="list-style-type: none">▪ Effective and reliable Warning dissemination to citizens and visitors.▪ Annually increase local warning dissemination capabilities by 10%, based on the baseline established in 2010.	\$159,180.00

Washington State Emergency Management

FY 11 Funding Request

Task (Activity) Name	NTHMP Performance Metric(s) (from Strategic Plan) Supported	Amount of Requested Funds
Task 4.1: Promote community-based training and education through continuation of the T-3 Program.	<ul style="list-style-type: none"> ▪ Establishment of more tsunami resilient communities. ▪ Ensure communities are prepared to respond during a tsunami event. 	\$57,300.00
Task 4.2: Partner with NWS Seattle/Portland WCM's to conduct TsunamiReady outreach workshops and develop custom action plans.	<ul style="list-style-type: none"> ▪ Establishment of more tsunami resilient communities. ▪ Ensure communities are prepared to respond during a tsunami event. ▪ Reduction of Loss of life and property damage from tsunamis. 	\$8,022.00
Task 4.3: Continue to support development and reprinting of tsunami public education materials for use by tsunami communities to prepare citizens and tourists for tsunami emergencies.	<ul style="list-style-type: none"> ▪ Support tsunami outreach efforts to coastal residents, media, coastal businesses, and tourism. 	\$34,380.00

Washington State Emergency Management FY 11 Funding Request

Task (Activity) Name	NTHMP Performance Metric(s) (from Strategic Plan) Supported	Amount of Requested Funds
Task 4.4: Install tsunami evacuation and hazard zone signs in new tsunami communities and replace signs that have been damaged or stolen	<ul style="list-style-type: none">▪ Establishment of more tsunami resilient communities.▪ Ensure communities are prepared to respond during a tsunami event.	\$11,460.00
Task 4.5: Increase warning dissemination via deployment of NAWAS to tribes in order to become TsunamiReady.	<ul style="list-style-type: none">▪ Effective and reliable warning dissemination to citizens and visitors.▪ Encourage authorities to receive and respond to Tsunami Warning Center products.	\$6,876.00
Task 4.6: Provide NOAA Weather Radios to low-income and special needs populations in at-risk communities in Grays Harbor County.	<ul style="list-style-type: none">▪ Effective and reliable warning dissemination to citizens and visitors.▪ Annually increase local warning dissemination capabilities by 10% based on the baseline established in 2010.	\$8,595.00

Washington State Emergency Management FY 11 Funding Request

Task (Activity) Name	NTHMP Performance Metric(s) (from Strategic Plan) Supported	Amount of Requested Funds
Task 4.7: WA DNR to develop and reprint evacuation maps and based upon studies of earthquake induced ground failure and landslide potential inundation zones.	<ul style="list-style-type: none"> Develop decision support tools for emergency responders to better visualize and plan for potential impacts. Tsunami inundation maps that support informed decision making in tsunami-threatened communities. 	\$73,344.00

FY 11 Funding Request for Multi-State Projects

Task (Activity) Name	NTHMP Performance Metric(s) (from Strategic Plan) Supported	Amount of Requested Funds
Task 5.1: Continue to support the publishing of the NTHMP TsuInfo Alert publication.	<ul style="list-style-type: none"> Develop decision support tools for emergency responders to better visualize and plan for potential impacts. 	\$50,000.00

Washington State Emergency Management FY 10 Funding Request Summary

- Washington State Program Funding \$706,826
- Multi-State Project Funding \$50,000
- Total Funding Requested from NTHMP
and Tsunami Ready \$756,826

- Note: Funding Summary includes 14.6%
Agency Indirect Cost